Vaccine Passports

. Vaccine passports are certificates to establish proof of vaccination linked to the identity of the holder; the purpose of a passport is to aid the return to pre-COVID-19 activities and allow travel without compromising personal or public health.

Source:
The Royal Society

19th February 2021

. Current evidence suggests that a COVID-19 vaccine passport system is feasible, but that not all criteria have yet been satisfied and consideration should be given to what longer term precedents (e.g., commercial accessibility of registers, expanded state health surveillance) this may create.

**Source:
The Royal Society**

19th February 2021

12 criteria: A passport should;

1. meet benchmarks for COVID-19 immunity;
2. accommodate differences between vaccines in their efficacy, and changes in vaccine efficacy against emerging SARS CoV-2 variants. It should be:
3. internationally standardised with
4. verifiable credentials for
5. defined uses, and based on
6. a platform of interoperable technologies
7. secure for personal data
8. portable and
9. affordable for individuals and governments. It should meet:
10. legal and
11. ethical (equity and non-discrimination) standards, and,
12. the conditions of use should be understood and accepted by passport holders.

Source: The Royal Society 19 Feb 2021

1. Meet benchmarks for COVID-19 immunity;

A passport could serve **two purposes**. To certify that passport holders:

- **are protected from illness** so they can carry out the activities for which the passport is needed and avoid additional burdens on health services; and,

- **cannot become infectious** and transmit SARS-CoV-2 to others.

1. Meet benchmarks for COVID-19 immunity; (cont.)

At present, there are only two viable passporting tests, neither of which is entirely satisfactory:

- a recent negative RNA (PCR) test within a particular time-specified interval to certify that subject is unlikely carrying a transmissible infection; and,

- vaccination to signify immunity.

1. Meet benchmarks for COVID-19 immunity;

National Health Services should record the following four different tests of infection and immunity might satisfy these goals:

- **viral RNA test-negative** (**PCR test**); and
- **viral antigen test-negative** (**lateral flow test**) and that the subject is immune to COVID-19 illness and will not become infectious:
- **viral antibody test-positive**; and,
- Which **vaccination** and when (1st and 2nd dose) & following booster shots.

➜ **NHS database will give more insight for public health**

➜ **Detailed vaccination data will help research**

2. Accommodate differences between vaccines in their efficacy, and changes in vaccine efficacy against emerging SARS CoV-2 variants

To place greater confidence in vaccine certification, more information is needed about:

- the efficacy of vaccines in preventing infection and transmission by the currently circulating viruses, including genetic variants; and,

- duration of protective immunity (both to illness and infectiousness) to determine frequency of **vaccine passport renewal**.

  ➡ **Paper does not work due to counterfeit. Digital is the solution**

3. Be internationally standardised

The International Certificate of Vaccination or Prophylaxis (ICVP) or the 'yellow card' is a precedent in this area.

The WHO has initiated a Smart Vaccination Certificate that will establish key specifications, standards, and a trust framework to facilitate implementation of effective and interoperable digital solutions.

Some countries have already introduced vaccine certificates through website portals (Denmark), a QR code valid at travel borders (Iceland) but also link certificates to quarantine (Estonia) or to ease restrictions related to socialisation and movement (Poland, Israel). Expert bodies in some countries note that prior to introduction, more information is still required about vaccination efficacy, transmission and data protection, ethical and legal issues (Germany, Netherlands, Spain)

International Standard for Online Digital Platform
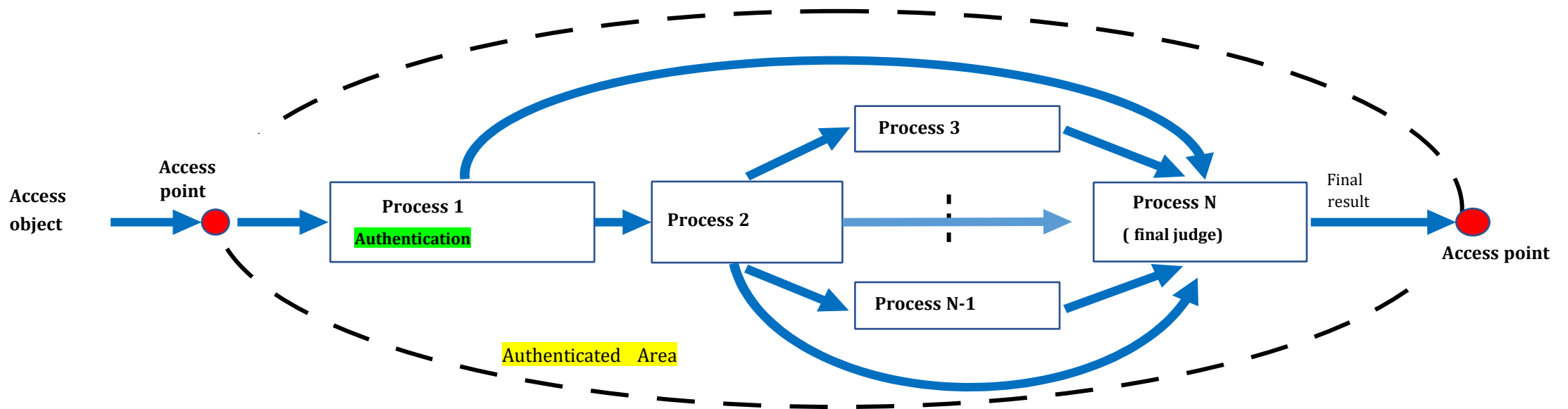## ISO/IEC 24643 (Ecma-417) Distributed Real-time Access System

Figure 1 — Access System Behaviour

Standard for systems for real-time processing is published by ISO on 23rd November 2020
GVE's digital platform has both (1) Authentication function (Process 1) and (2) Authenticated
Area function ensuring the Process 1 to Process N have not been hacked (yellow shadow)
Criteria 3, 4, 6 – 9 are satisfied by GVE's platform

3. Be internationally standardised and interoperability (cont.)

GVE takes care of authentication of the individuals carrying the passport with the data authentication with 24/7/365 real time access to vaccine database

Each country can use different application as Process 3
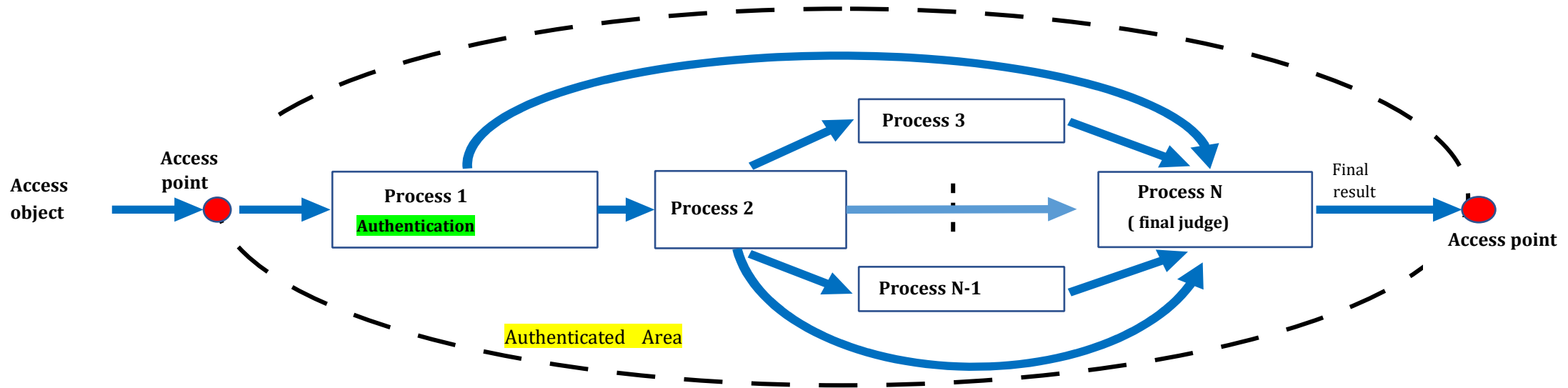
4. Have verifiable credentials

International and industry-based initiatives are being developed using **international verifiable credentials** and standards. The Common Pass and COVID-19 Credentials Initiative are consortiums working toward primarily App-based digital solutions using a QR code that can be displayed without releasing personal sensitive information. Others focus on products that allow individuals to share their vaccination and health status (to employers, authorities) while preserving privacy.

Technical challenges exist such as those related to form (digital, paper), forgery, and attention to privacy and identify proofing.

➞ These technical challenges can be solved using smart phone's biometrics and end-to-end authentication design following ISO/IEC 24643

5. Have defined uses:

The uses of vaccine passports need to be clearly defined as they carry the risk that they could be used to discriminate in hiring or access to restaurants, health care centres, sporting or cultural events, insurance companies, or housing applications or other services. Additional concerns are whether vaccination data could be used for other unintended reasons or data linkage, such as by immigration authorities, and precedents (e.g., commercial accessibility of registers, expanded state health surveillance) it may create.

➔ **2 proposed options.** (1) Vaccine passport and payment service only as default, and (2) bundled service with additional defined uses. The (2) option will reduce the cost of operation and the service becomes more affordable for lower income countries

# 6. Based on a platform of interoperable technologies

The technology must meet certain standards for interoperability (**HL7 FHIR standards**), which is the ability of systems to work together within and across organisational and technical boundaries to enable different information technology systems to communicate and exchange useable data.

➞ Technology-wise, ISO/IEC 24643 ensures the interoperability with any applications.

➞ Aston may want to pursue making vaccine passports use-case as the Part 2 of the ISO/IEC 24643. The Ecma-International TC51 meeting for Ecma-417 (ISO/IEC 24643) took place on 1st June to proposed change in August 2021.

6. Based on a platform of interoperable technologies (cont.)

Each country is able to select the application suitable to their domestic legal and ethical rules. This national application will be installed to Process 3 of the ISO/IEC 24643 while GVE's platform will ensure the acceptance with the ICAO, and immigration offices of each country
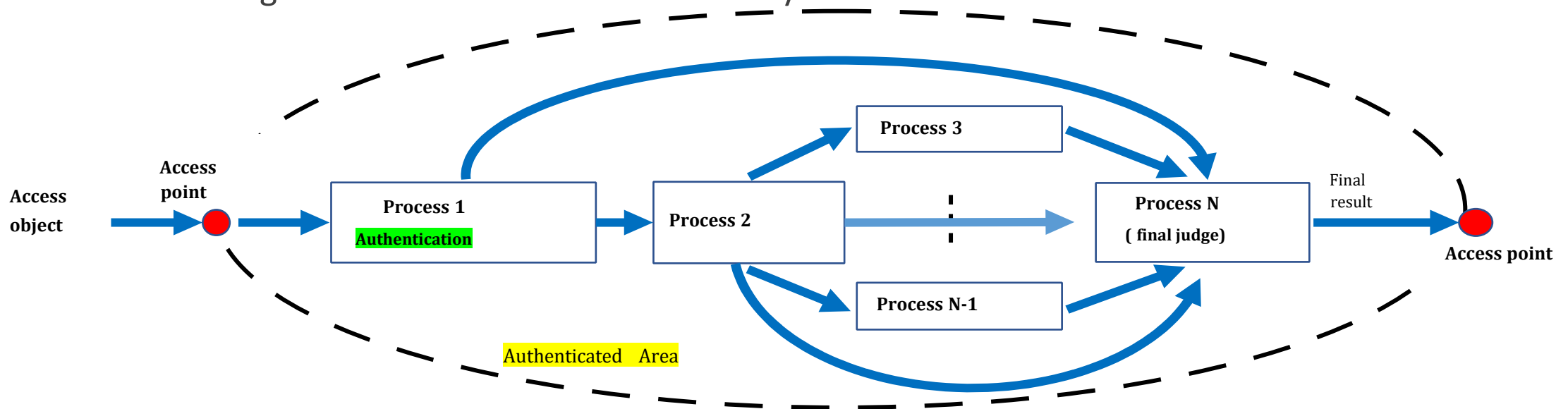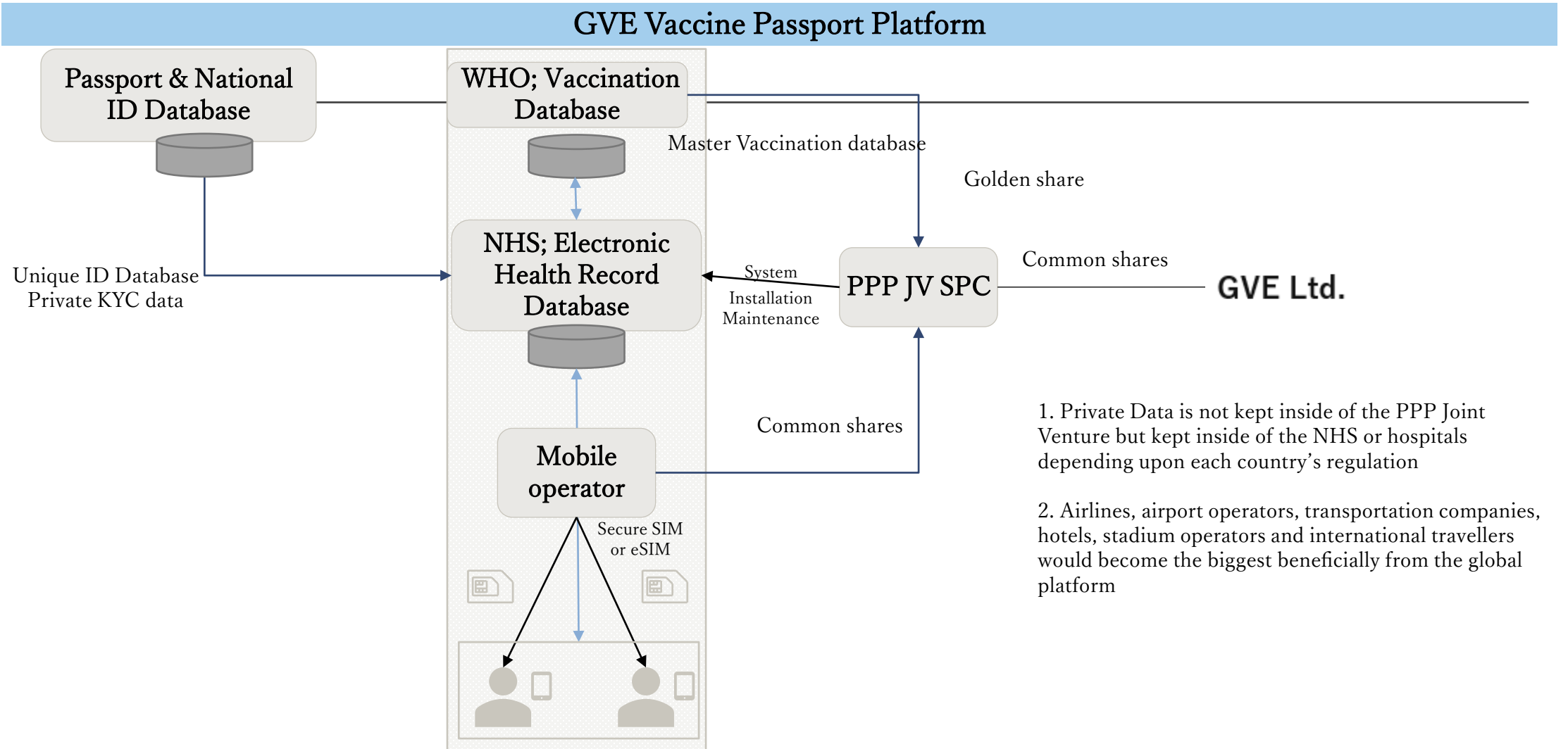
7. Be secure for personal data

A fair balance of data protection and privacy requirements must be considered, in particular to guard against the use of such a passport to track populations, and for unrelated additional scrutiny of already marginalised groups, for example by police, employers or health checks.

Health data – including vaccination records – are protected under the GDPR; these data must therefore be monitored, with technical and organisational measures to proactively deal with data transfers. There are potentially undesirable outcomes if vaccine status were used to compound already disadvantaged characteristics (e.g., age, ethnicity).

7. Private Data Protection; compliant with GDPR

Through multiple partnerships among Aston, the WHO, ICAO, mobile operators and GVE, to develop the vaccine passport platform, a global solution can be implemented both for international travel and for the domestic use

GVE Vaccine Passport Platform

Passport & National ID Database

WHO; Vaccination Database

Master Vaccination database

Golden share

NHS; Electronic Health Record Database

Unique ID Database
Private KYC data

System
Installation
Maintenance

PPP JV SPC

Common shares

GVE Ltd.

Common shares

Mobile operator

Secure SIM or eSIM

1. Private Data is not kept inside of the PPP Joint Venture but kept inside of the NHS or hospitals depending upon each country's regulation

2. Airlines, airport operators, transportation companies, hotels, stadium operators and international travellers would become the biggest beneficially from the global platform

7. Be secure for personal data – recommended default setting

Private data is kept at the hospitals where the original electric health record (EHR) is created and kept. (The originator should be the administrator in charge.)

Vaccine data should be kept inside of the EHR at NHS or each hospital depending upon the each country's regulation or practices

Each vaccine passport application holder is able to access to his/her own vaccine passport database in real time 24/7/365 via GVE's secure mutual authentication platform

The smartphone holder's identity verified at the immigration office if the ICAO e passport is connected to the platform

8. Be portable

There needs to be clarity across multiple aspects such as biometric authentication, QR codes, card readers, or paper copies to provide flexibility for individuals and governments.

→ Biometric authentication with smartphone together with the e-Passport registration is the best way to protect the private data while satisfying the immigration control

→ Restaurants, pubs, stadium operators do not require additional investment as the NFC installed devices (e.g., smart phone handsets, tablets) can function as readers via NFC

9. Be affordable for individuals and governments

There must be sufficient resources to develop and sustain vaccine passports. If there are costs to acquiring a certificate or access issues, affordability needs to be considered.

→ The combination of already developed platforms and additional applications would provide the most affordable solution (i.e., combination of e passport by ICAO and EXC platform by GVE plus applications suited for each domestic rules)

→ Legacy credit card operators cannot offer affordable solutions

https://www.businessinsider.com/mastercard-visa-credit-card-fee-hikes-may-be-on-horizon-2021-2?r=US&IR=T

10. Meet legal standards:

Certification needs to be consistent with various legal standards, including:

- international, regional and domestic human rights laws,

- data protection laws,

- equality and discrimination laws,

- COVID-19 legislation; and,

- labour, occupational health and safety laws, but considerations need to be weighed against duty of care and commercial freedom to act

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11. Meet ethical, equity and non-discrimination standards

Core ethical concerns require further scrutiny including:

- testing whether vaccine passports are inclusive,

- have clearly defined uses and minimum data collection,

- appropriate sharing and who gains access to the information;

- where and how vaccine certification will be linked to other types of data; and,

- avoidance of discrimination and exacerbating existing inequalities (e.g., vaccine hesitancy in certain groups, pregnant women, differential roll-out or access, digital divide).

12. Have conditions of use should be understood and accepted by passport holders

Ensure that individuals understand the utility of vaccine passports and monitor public acceptance and experiences. Unintended behavioural responses and resistance could arise if uses are not transparent, making it essential to monitor impacts on vaccine hesitancy, trust, incentives and responses and in communication strategies.

IATA Travel Pass & ICAO

IATA is pushing for its Timatic system for the airlines

ICAO has had the e-passport standard set

It would be more cost effective to coordinate with IATA Timatic and ICAO e-passport on a single platform in order to avoid additional devices at the airport

GVE's EXC platform enables to coordinate the IATA Timatic and ICAO e-passport to create a comprehensive vaccine passport system without compromising with the privacy

Complexity and variety

The fragmented and diverse set of COVID-19 testing requirements for entry and exit as well as the range of different types of tests (PCR, LAMP, antigen and spectroscopic) required by governments have created a challenging and complex environment for immigration authorities, passengers and airlines to navigate.

Information gap

Passengers are confused and need accurate information. But they do not know where to find it – or understand it, even if they do find it.

Inefficiencies, errors, fraud

Check-in agents need to follow extensive entry requirement guidance and try to determine the authenticity of multiple non-standard test documents passengers present to them. This leads to health check inefficiencies, errors and fraud – an increasing problem around the world.

Challenges to accurate data

Source:

IATA Travel Pass Briefing

Governments with the means to verify the authenticity of tests and the identity of those presenting the test certificates.

Airlines with the ability to provide accurate information to their passengers on test requirements and verify that a passenger meets the requirements for travel.

Laboratories with the means to issue certificates to passengers that will be recognized by governments, and

Travellers with accurate information on test requirements, where they can get tested or vaccinated, and the means to securely convey test information to airlines and border authorities

Systematic Testing Support

Source:

IATA Travel Pass Briefing

A global and standardized solution to validate and authenticate all country regulations regarding COVID-19 passenger travel requirements. IATA Travel Pass will incorporate four open sourced and interoperable modules which can be combined for an end-to-end solution:

IATA Travel Pass

Source:

IATA Travel Pass Briefing

Enables passengers to find information on travel, testing and vaccine requirements for their journey
Powered by <u>IATA Timatic</u>

Registry of Health Requirement

Source:

IATA Travel Pass Briefing

Enables passengers to find testing centres and labs at their departure and/or arrival location that can conduct COVID-19 tests in accordance with the type of test required for their journey

Registry of Testing / Vaccination Centres

Source:

IATA Travel Pass Briefing

Enables authorized labs and test centres to securely send test results or vaccination certificates to passengers

LAB APP | Source:

IATA Travel Pass Briefing

Enables passengers to (1) create a 'digital passport', (2) verify their test/vaccination meets the regulations & (3) shares test or vaccination certificates with authorities to facilitate travel.

Can be used by travellers to manage travel documentation digitally and seamlessly throughout the travel experience.

Travel Pass

Source:

IATA Travel Pass Briefing

The main priority is to get people traveling again safely. In the immediate term that means establishing confidence in governments that systematic pre-departure COVID-19 testing can work as a replacement for quarantine requirements. And that will eventually develop into a vaccine program.

The IATA Travel Pass is a solution for both. It is built it in modules as an industry solution based on open-source standards. It can be used in combination with other providers or as an end-to-end solution. The most important thing is that it is responsive to industry needs while enabling a competitive market.

Registry of Testing / Vaccination Centres

Source:

IATA Travel Pass Briefing

Conclusion

With the cooperation from the WHO, NHS, IAO, Ecma-International, Aston University and GVE can create one of the most comprehensive electric vaccine passport system

➜ e passport https://en.wikipedia.org/wiki/Biometric_passport

➜ See the diagram at the bottom of this page for a sample illustration https://www.cyberware.co.jp/solutions/epassport-pki-solution/